

## **REMARKS**

Applicant objects to the rejection of Claims 4, 5, 9-12, 14-15, 17 and 19, which were previously indicated to be allowable, over the same art that was previously before the examiner, particularly in light of the examiner's failure to address the issues raised by applicant in the previous response.

### **§101 Rejections**

Applicant does not understand the rejection under §101. The examiner admits that the claimed invention produces a useful, concrete and tangible result, but that it "does not involve, use, or advance technological arts (e.g., **processor, computer, electronic computing device**) since the steps could be performed using pencil and paper." (Office Action, page 4 emphasis in original). The examiner has not provided the necessary factual or legal support for the rejection.

The claims are directed to the scheduling of a plurality of train resources. The scheduling of a plurality of resources is a well known complex technological problem, as evidenced by the nearly 120 references directed to this problem submitted by the applicant in the prosecution of this application each of which describes the use of computer implemented methods. The evidence of record in this case provides conclusive support that the scheduling of a plurality of resources is far too complex for pen and paper as asserted by the examiner and thus there is no factual support for the examiner's rejection.

However, even if a process can be performed by pen and paper, there is no legal support for finding that the claim is directed to non-statutory subject matter. The fact that a process can be performed using pencil and paper is not relevant to whether the claim is directed to statutory subject matter. “The inclusion in a patent of a process that may be performed by a person, but that also is capable of being performed by a machine is not fatal to patentability.” *Alco Standard Corp v. Tennessee Valley Authority*, 808 F.2d 1490 (Fed. Cir. 1986). Thus, even if the pending claims could be performed by pen and paper, which applicant does not assert is possible, it does not mean the claims are directed to non-statutory subject matter. Withdrawal of the §101 rejection is solicited. If the examiner persists in this rejection, the applicant requests that examiner identify the legal authority which states that a process which is capable of being performed using pencil and paper “does not involve, use, or advance the technological arts.”

### **§103 Rejections**

The Office Action asserts that Claims 2-7 are obvious over Matheson in view of Fabre. The applicant objects to the examiner’s failure to address applicant’s previous arguments regarding the combination of Matheson and Fabre. Specifically, the fact that Matheson discloses many different parameters for consideration in scheduling trains does not make obvious the many different relationships between the parameters which may be utilized to evaluate the schedule. In the present application, the applicant has identified specific relationships, which when utilized result in an improved schedule optimized to the specific relationships. None of the relationships were disclosed in the prior art and

the examiner has not provided his reasoning for why the selection of the parameters and definitions of the relationships chosen by the applicant would be obvious to one skilled in the art. The fact that applicant's disclosure does result in an improved schedule is not evidence that such disclosure of the desired relationship between the parameters would be obvious to one skilled in the art. It is axiomatic that a particular parameter must first be recognized as a result-effective variable in the prior art before the examiner can assert that a claimed optimum value of the result-effective variable is obvious over the cited art. *In re Antonie*, 559 F.2d 618, (CCPA 1977). The relationships claimed in the present application were not recognized as result-effective variables in the prior art and thus the applicant's disclosure of the result-effective and the optimum values of the result-effective variables cannot be obvious over the cited art.

For example, the examiner has admitted that "Matheson discloses rule-based criteria that incorporate company policy, operating procedures, and experience factors, among others, wherein train operating procedures include total trip time and slack time, associated therein" ( Page 16). However the examiner has not provided the basis for the examiner's selection of only some of the many parameters admittedly disclosed in Matheson in order to support the examiner's rejection, apart from applicant's present disclosure.

Claim 2 recites, *inter alia*, that the scheduling problem is classified "as a function of the total trip time and the total slack time." The applicant discloses that the relationship between the total trip time and the total slack time is a result-effective

variable, and the applicant further discloses the optimum values for the result effective variable. In order to support his rejection the examiner must identify where the cited art identifies the result effective variable of the relationship between total trip time and total slack time. Matheson discloses many parameters (as admitted by the examiner) but does not disclose a relationship between the total trip time and total slack time or for classifying the problem as a function of these parameters. Thus there is no basis for the examiner's selective combination of only two of the many parameters disclosed in Matheson to support the examiner's obviousness rejection.

By way of further example, amended Claim 6 recites, *inter alia*, that the scheduling problem is classified "as a function of the total trip time and the resource exception." The applicant discloses that the relationship between the total trip time and the resource exception total slack time is a result-effective variable. Matheson discloses many parameters (as admitted by the examiner) but does not disclose a relationship between the total trip time and the resource exception for classifying the problem as a function of these parameters. In order to support his rejection the examiner must identify where the cited art identifies the result effective variable of the relationship between total trip time and resource exception for classifying the scheduling problem. The applicant requests that the examiner provide the basis for the selection of only two of the many parameters disclosed in Matheson, apart from applicant's disclosure.

Note that the examiner's citation to Fabre as disclosing classification as a function of a certain criterion is not relevant to the claimed limitations when the specific criterion

disclosed in Fabre is not the same criterion claimed in the present claims.

Reconsideration and allowance of Claim 2 and Claim 6 is requested. Claims 3-5 ultimately depend from Claim 2 and Claim 7 depends from Claim 6, and are therefore allowable with their respective base claims without recourse to the further patentable limitations respectively recited therein.

Claim 17 is rejected as obvious over Matheson alone. Like Claims 2 and 6, Claim 17 is directed to the evaluation of a specific relationship as a result-effective variable. Claim 17 recites the relationship between total resource exception and total unopposed trip time and recites an optimum value for this relationship. The examiner has failed to provide any rationale for the examiner's selective combination of two of the many parameters disclosed in Matheson in order to support the rejection. Thus, for the same reasons as identified with respect to Claims 2 and 6, the rejection to Claim 17 must be withdrawn.

Claims 13-16 are rejected as obvious over Matheson in view of Fabre. Claim 13 recites, *inter alia*, "weighting the resource exception and cost factors associated with the random move with a scaling parameter related to the classification of the problem." The examiner has taken the position that "the Fabre system indeed incorporates a scaling parameter related to the classification of the problem. Selecting the opportunities in a specified order (i.e., scaling parameter) **inherently** weighs the opportunities, determined by the previous classification." (Page 17). First, the selection of the order of the opportunities is not relevant to the claimed weighting of the specific parameters using a

scaling parameter. Note that there is no disclosure of weighting the criterion in Fabre, and it is the weighting of the parameters (or criterion) that is specifically claimed in the present claims. Second, inherency requires that the missing descriptive matter be “necessarily present.” *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264 (Fed. Cir. 1991). The mere fact that a certain thing may result from a given set of circumstances is not sufficient. *Ex parte Skinner*, 2 U.S.P.Q 2d 1788 (B.P.A.I. 1986). Clearly, the fact that Fabre discloses that the opportunities are selected in an order determined by the classification does not necessarily mean that one opportunity is weighted more than the other. Note, for instance, if an earlier order opportunity results in a plan that is not in compliance with all of the constraints, the opportunity would be rejected. Thus the selection of the opportunities in order does not necessarily mean that an earlier opportunity is weighted more than a latter opportunity. Reconsideration and allowance of Claim 13 is requested.

Claims 14-16 ultimately depend from Claim 13 and are therefore allowable with Claim 13 without recourse to the further patentable limitations respectively recited therein.

Claims 18 is rejected as obvious over Matheson alone.

Claim 18 is directed to the improvement of **reducing the level of acceptance of a solution in early moves** in order to preserve options in later moves. Matheson teaches away from this feature and therefore cannot serve as the basis for an obviousness rejection. For example, at Col. 19, lines 15-19, Matheson describes that the **level of**

**acceptance of a solution is increased in early stages and is reduced in later stages:**

- A. Generation of potential moves via constraints is random and distributed.
- B. Optimization allowed to take some bad moves in early stages.
- C. As temperature is reduced less bad moves are allowed.
- D. In final phases only good moves allowed.

Clearly, Matheson teaches away from the claimed features and the examiner has not provided any basis for deviating from the teachings of Matheson apart from applicant's current disclosure. Reconsideration and allowance of Claim 18 is requested.

Claim 19 is rejected as obvious over Matheson alone. Claim 19 is directed to weighting evaluations as a function of the departure of resource exceptions from the target. In support of his rejection the examiner asserts that "providing a target would be a logical progression" and that Matheson discloses "weighting" and that "constraints can be selected by the user." However, the cited art does not identify the specific target, nor the relationship that the weighting is a function of the departure of a specific parameter (resource exception) from the target, and the examiner has not provided the reason why these specific parameters should be chosen. Note that the examiner's stated rationale that it would result in "further focusing the optimization, and allowing the energy function to focus on critical resources" is the purpose of all simulated annealing methods, without regard to whether weighting as a function of the departure of a target resource is utilized. Reconsideration and allowance of Claim 19 is requested.

Claim 8 is rejected as obvious over Matheson in view of LeSaint. As in the previous office action, the art cited by the examiner does not support the examiner's

allegations. The passages cited by the examiner at page 16, ¶ 6-8 actually discloses that the four components are all cost components and the passages on page 17 ¶ 4-7 discuss minimizing the cost solely without any discussion of emphasizing cost over resource exception **for a predetermined initial period of the search phase**. Thus, there is no support for the examiner's rejection. Note that property P is utilized to evaluate cost and is not relevant to the claimed limitations of emphasizing cost over resource exception for an initial predetermined period of time. Reconsideration and allowance of Claim 8 is requested.

Claims 9-12 ultimately depend from Claim 8 and are therefore allowable with Claim 8 without recourse to the further patentable limitations respectively recited therein.

### **CONCLUSION**

The claims as amended clearly define over the cited art and the obviousness rejection is improper because there is absolutely no motivation or teaching to support the selective combination of prior art as asserted in the Office Action. In order to expedite the prosecution of the present application, and in light of the re-application of previously considered art, the applicant requests that the examiner contact the applicant's



representative to schedule a personal interview to discuss applicant's response. The

Applicant requests allowance of Claims 2-19.

Respectfully submitted,



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